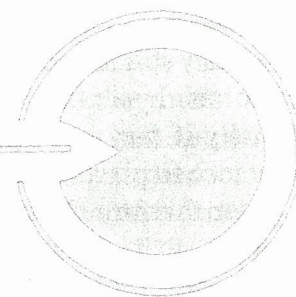


BIO-PROBE

NEWSLETTER



Volume 16

January 2000

Issue 1

ARE DENTAL COMPOSITES SAFE?

Since the publication of a Spanish study in 1996 [Olea, N; et al. *Estrogenicity of Resin-Based Composites and Sealants Used in Dentistry*. Environmental Health Perspect., 104(3):298-305, 1996] the question of potential estrogenic properties of dental composites has received wide attention. Few realize that the Olea study subjected the composites to extremes of heat (100°C), followed by immersion in the strongest of acid (pH1) or alkaline (pH13) media.

Table of Contents

Are Dental Composites Safe	1
Mercury and Lou Gehrig Disease	2
California Dental Board Urges Warnings on Mercury	3
Science	
Preliminary Estimates of Adult Exposure to Bisphenol-a from Dental Materials, Food and Ambient Air; Richardson, GM; et al	4
Mercury Intoxication Simulating Amyotrophic Lateral Sclerosis. Adams, et al	4
Inorganic Mercury is Transported from Muscular Nerve Terminals to Spinal and Brainstem Motoneurons. Arvidson, B	4
Inorganic Mercury Intoxication Reminiscent of Amyotrophic Lateral Sclerosis. Barber, TE	5
Trace Element Imbalances in Amyotrophic Lateral Sclerosis. Kharē Mercury in Hair of Patients with ALS. Mano, et al	5
Amyotrophic Lateral Sclerosis and Mercury. Mano, et al	5
Motor Neuron Uptake of Low Dose Inorganic Mercury. Pamphlett & Waley	6
Oxidative Damage to Nucleic Acids in Motor Neurons Containing Mercury. Pamphlett, et al	6
Recovery from Amyotrophic Lateral Sclerosis and from Allergy after Removal of Dental Amalgam Fillings. Redhe & Pleva	7
Chronic Low-Dose Maternal Exposure to Methylmercury Enhances Epileptogenicity in Developing Rats. Szasz; et al	7
Forum	
IAOMT 2000 Mid-Year Meeting	8
AAHNP Meeting	8

Bio-Probe has presented several studies that have contradicted the Olea, et al findings [see BPNL, 15(4):6-7, Jul 1999; BPNL, 13(2):7, Mar 1997]. Further, we reported on a formal risk assessment concluding that patient exposure to BIS-GMA breakdown products formaldehyde and methacrylic acid were 10,000 and 1,600,000 times lower, respectively, than relevant reference doses [see BPNL, 13(5):4-5, Sep 1997].

A quantitative risk assessment study by G. M. Richardson and associates, specifically investigating patient exposure to Bisphenol-a, has just been published [see Science section in this issue]. This study utilized established risk assessment procedures and published data.

Besides its use in dental composites, BIS-GMA is also used to line food and beverage cans and is found in the atmosphere as an industrial pollutant. The study determined that human exposure to Bisphenol-a from all three sources was 65 times lower than the acceptable level (TDI) established by the Canadian government. The exposure from dental composites was 140 times lower than the Canadian standard.

One must not consider this proof that dental composites are harmless to ALL patients. There

© 1999 Bio-Probe, Inc. The Bio-Probe Newsletter is published bimonthly. Editorial office is at 5508 Edgewater Dr., Orlando, FL 32810. Subscription price in U.S. funds, U. S. and Canada \$75.00 per year; other countries \$90.00 Postage paid at Orlando. (407) 290-9670.

is obviously still the possibility of patients being allergic or hyper reactive to the material, especially if they have previous experience of intolerance to plastics (petrochemicals).

However, this formal risk assessment is strongly indicative that dental composites do NOT present a health risk to most patients. This is in direct contrast to patient exposure to mercury from dental amalgam fillings, which has been shown to far exceed established standards in the United States and Canada.

MERCURY AND LOU GEHRIG DISEASE

Amyotrophic Lateral Sclerosis (Lou Gehrig Disease, ALS): "*The etiology is unknown.*" "*Though some patients have lived for >5 yr, the prognosis is grave and death usually occurs in 2 to 5 yr. Motor neurons degenerate in the spinal cord, medulla, and motor cortex. Atrophy occurs in the fibers of the muscles.*"; and "*No specific treatment is known.*" [The Merck Manual, 12th Edition. Ed: Alpert, E; et al. Merck Sharp & Dohme Research Laboratories; Rahway, NJ, 1972.]

ALS is fatal, has no known cause and no known treatment! A reference text addresses the subject of ALS thoroughly [Kasarskis, EJ; Ehmann, WK; Markesberry, WR. *Trace Metals in Human Neurodegenerative Diseases*. In: *Essential and Toxic Trace Elements in Human Health and Disease: An Update* Pg. 299-310, Wiley-Liss, Inc. 1993 (see BPNL, 9(5):2-3, Sep 1993)].

The authors state that "*it has been shown that 50% of spinal motor neurons will have degenerated before the typical features of the disease are noticed. Therefore, the exposure to a harmful neurotoxin could have occurred many years preceding the clinical onset of the disease.*" They also point out that there is no evidence of viral involvement, and that a genetic factor may render motor neurons more susceptible to secondary insults, such as environmental toxins.

These authors further state that scientists are now focused on exposure to environmental toxins, especially lead and mercury, and that epidemiologic evidence indicates that long-term exposure to heavy metal is more common among ALS victims compared to controls. They further point out that an ALS-like syndrome has been linked to chronic intoxication with mercury and lead.

These, and other, details indicate that long term exposure to dental amalgam derived mercury should receive the strongest of consideration in the investigation of ALS. It is well established that mercury can cause irreversible damage to the nervous system. It hardly seems responsible to wait until 50% of the motor neurons have been destroyed before consideration is given. Scientifically, it has been well established that mercury accumulates in motor neurons, even when the exposure is to very low doses [Cited studies abstracted in "Science" section below.] (Arvidson, B, 1992; Pamphlett & Waley, 1996). It has also been demonstrated that mercury causes oxidative damage to motor neurons (Pamphlett, R; et al, 1998). These studies are only a representation of the many published studies demonstrating these factors.

Scientists in Japan have been particularly interested in the possible connection between ALS and exposure to mercury. A statistically significant positive correlation between ALS and hair mercury has been reported (Mano, et al; 1989). A deficiency of selenium in relation to mercury exposure has also been investigated by these scientists (Mano, et al; 1990). This factor has also been emphasized by other scientists. A research team at the University of Kentucky measured levels of trace elements in the brain tissue of ALS victims (Khare, et al; 1990). They stated: "*The changes observed in Hg concentration and the interactions of Hg and Se are worthy of special comment and may possibly be relevant to the pathogenesis of ALS.*"